

[0097] As the peripheral region adhesion layer **1001**, Structbond UC series manufactured by Mitsui Chemicals Inc. or 3025G manufactured by THREE BOND CO., LTD. is used. The glass transition temperatures of Structbond UC series and 3025G are about 109° C. and about 140° C., respectively.

[0098] The first adhesion layer **103** is formed to have a thickness of about 10 μm to 50 μm and hardened by irradiation with ultraviolet rays through the plastic substrate at a room temperature.

[0099] The pixel region adhesion layer **1002** desirably has a glass transition temperature of 30° C. (inclusive) to 80° C. (inclusive). For example, it is possible to use an acryl-based ultraviolet ray curable adhesive, allyl-based ultraviolet ray curable adhesive, thermosetting acryl-based adhesive, or thermosetting allyl-based adhesive.

[0100] The peripheral region adhesion layer **1001** desirably has a glass transition temperature which is higher by 10° C. or more than that of the pixel region adhesion layer **1002** and is 80° C. (inclusive) to 200° C. (inclusive). For example, it is possible to use an allyl-based ultraviolet ray curable adhesive, epoxy-based ultraviolet ray curable adhesive, or thermosetting epoxy-based adhesive.

[0101] Both the peripheral region adhesive **1001** and pixel region adhesive **1002** are preferably photo-setting type adhesives, since deformation upon adhesion is small. However, two-part adhesives, thermosetting type adhesives, or hot-melt type adhesives can also be used by properly selecting materials and conditions.

[0102] Since the peripheral region has no pixel, the peripheral region adhesion layer **1001** may be opaque, so the glass transition temperature may be raised by mixing fillers or the like. The glass transition temperature of the peripheral region adhesion layer **1001** is preferably higher by 10° C. or more than that of the pixel region adhesion layer **1002**. Note that the peripheral region need not completely surround the pixel region, i.e., the peripheral region may be configured to surround the two or three sides, including the side on which the connecting pad electrode is formed, of the pixel region.

[0103] As the first plastic substrate **104**, it is possible to use, e.g., polyether sulfone (PES), polyethylene naphthalate (PEN), polycarbonate (PC), or a polyolefin-based polymer such as cycloolefin polymer, acrylic resin, liquid crystal polymer, reinforced plastic mixed with an inorganic material, or polyimide. It is possible to appropriately select a thermoplastic resin, thermosetting resin, crystalline resin, or amorphous resin. Transparent or opaque plastic can also be used. PES or Arton which is a polyolefin-based resin manufactured by JSR Corporation is suitable for a liquid crystal because each material has small optical anisotropy and small birefringence. Also, an amorphous transparent resin is favored because its isotropy and flexibility are high. Note that the plastic substrate may be coated with a resin or inorganic film.

[0104] As shown in FIGS. 8A and 8B, the second non-alkaline glass substrate **202** is thinned by polishing to form a second thin glass layer **105**. After the rear surface of the first plastic substrate **104** and the side surfaces including the first adhesion layer **103** and first thin glass layer **101** are protected with a chemical-resistant sheet (not shown), chemical etching is performed in the same manner as for the

first non-alkaline glass substrate **201**. The polishing method can be mechanical polishing or CMP. The thickness of the second thin glass layer **105** is preferably equivalent to that of the first thin glass layer **101**, and is about 50 μm in this embodiment.

[0105] As shown in FIGS. 9A and 9B, a second plastic substrate **107** is bonded to the second thin glass layer **105** via a second adhesion layer **106**. This second adhesion layer **106** also includes a peripheral region adhesion layer **1001** and pixel region adhesion layer **1002** having properties analogous to those of the first adhesion layer **103**. That region of the second thin glass layer **105**, which is outside the seal **108** is bonded to the second plastic substrate **107** by at least the peripheral region adhesion layer **1001**.

[0106] In this embodiment, Structbond UC series manufactured by Mitsui Chemicals Inc. is used as the peripheral region adhesion layer **1001**, and TB3042 manufactured by THREE BOND CO., LTD. is used as the pixel region adhesion layer **1002**. The thickness of the adhesion layer **106** is 10 μm to 50 μm . The second plastic substrate **107** is 0.1-mm thick PES.

[0107] In positions indicated by the dotted lines in FIG. 10A and the arrows in FIG. 10B, a portion from the first thin glass layer **101** to the first plastic substrate **104** and a portion from the second thin glass layer **105** to the second plastic substrate **107** are cut, thereby extracting a portion serving as a display device as shown in FIGS. 11A and 11B. These thin glass layers and plastic layers are simultaneously cut by using a laser. It is also possible to form a number of display devices at once by using large non-alkaline glass substrates and plastic substrates and cutting these display devices in this step. When a CO₂ laser or a UV-YAG laser of a secondary, tertiary, or quaternary harmonic component is used, the end faces are smoothly cut, and cracking of the thin glass layers from these end faces can be prevented. If necessary, the end faces can be further polished to form smoother surfaces. Furthermore, the plastic substrates and thin glass layers can be separately cut by selecting respective appropriate laser emission conditions and cutting methods, without being simultaneously cut.

[0108] As shown in FIGS. 12A and 12B, a liquid crystal is injected and encapsulated. A cell and liquid crystal reservoir are placed in a vacuum chamber, and the vacuum chamber is evacuated. After the chamber is well evacuated, the injection hole **204** is brought into contact with the liquid crystal reservoir, and a liquid crystal **109** is injected by gradually restoring the atmospheric pressure. Instead of this vacuum injection, suction injection may be performed by forming an injection hole and suction hole. The liquid crystal can be a nematic liquid crystal, cholesteric liquid crystal, ferroelectric liquid crystal, or polymer dispersion liquid crystal. The injection hole **204** is sealed with an ultraviolet ray curable resin **203** or the like to complete the cell.

[0109] When a TN (Twisted Nematic) liquid crystal is used as the liquid crystal **109** to obtain a transmitting type display device, as shown in FIGS. 13A and 13B, polarizers **206** are formed on the outer surfaces of the first and second plastic substrates **104** and **107**. For example, when the second plastic substrate **107** is used as a viewing side, the viewing angle can be increased by adding a retardation film to the polarizer on this side as in the conventional display